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By email only: John .Gerring@sstaffs.gov.uk

Dear John,

Re: West Midlands Interchange, Four Ashes
Review of ES Noise Chapter & Addendum Report

Further to your recent instruction, I am writing with the findings of our independent technical review of the noise chapter (and subsequent addendum) of the Environmental Statement that was prepared in connection with the proposed construction and operation of the West Midlands Interchange at Four Ashes, Staffordshire.

The proposed development is for a Strategic Rail Freight Interchange, with connection to the West Coast Main Line and associated warehousing, to be located on land to the west of Junction 12 of the M6 motorway.

The proposal is the subject of a Development Consent Order planning application which is to be determined by the Planning Inspectorate, and ultimately the Secretary of State.

Introduction

1. The noise chapter of the Environmental Statement was prepared by Resound Acoustics Ltd on behalf of the applicant, Four Ashes Ltd

2. The purpose of this review is to check that the noise chapter follows the correct approach and standards and that the findings adequately describe the likely noise and vibration impacts on the living conditions of nearby residents. Our scope of work is thus a 'desktop' review of the noise chapter.

3. Rather than comment on the chapter paragraph by paragraph we have provided an overview of the noise assessment and have only referred to specific paragraphs, tables, etc. when considered necessary.

4. The author of this review has the following qualifications:- BSc(Hons.) in Environmental Science; the Institute of Acoustics 'Diploma in Acoustics and Noise Control'; and MSc in Environmental Acoustics. He has 30 years of experience in the monitoring, assessment and control of environmental noise. He has been employed for the last 25 years by Hepworth Acoustics Limited and holds the position of Technical Director. He is a Fellow of the Institute of Acoustics.

Documents

5. This review has focussed on the following documents in the Environmental Statement and Addendum:-

   Chapter 13 - Noise and Vibration

Technical Appendices 13.1 to 13.5

Figures - 13.1 to 13.5

Subsequent 40-page Addendum Document 13 A – Noise and Vibration (marked Draft)

Revised Technical Appendices 13A.3

Revised Figures 13A.1 & 13A.2

6. Due to the Addendum report, some of the analysis and data tables presented in the noise chapter of the Environmental Statement remain valid, whilst others have been replaced by updated tables and analysis within the Addendum. This does not make the information easy to follow, and in this respect it would have been beneficial if the whole noise chapter had been replaced by one updated document.

7. Also, account has been taken of additional information provided in an email to the Council from John Rhodes, Quod Ltd (planning consultant) dated 20 December 2018, including plans and section drawings showing the extent and scale of proposals for landscaped bunding as part of the development.

Author of the Noise Chapter

8. The noise chapter of the Environmental Statement was prepared by Resound Acoustics Ltd (RAL). We are not familiar with this company but we note that RAL is a member of the Association of Noise Consultants. Details of the author of the noise chapter, including qualifications and experience, are not provided in the document.

Comments on General Approach to the Noise Chapter

9. Chapters in formal Environmental Statements have to follow a certain structure, procedure and terminology. We confirm that the general approach adopted in the noise chapter is in accordance with the EIA requirements.

National Legislation and Planning Policy

10. The noise chapter starts with a summary of relevant national legislation and planning policy documents. The summary is comprehensive and relevant legislation and planning policy documents are described.

11. The overarching planning policy for this particular development is embodied in the National Policy Statement for National Networks (NPS), the salient parts of which are summarised in the noise chapter. One of the key decision-making factors (in 5.195 of the NPS) is that the Secretary of State should not grant consent for the proposed development unless satisfied that the proposals will 'avoid significant adverse impacts on health and quality of life from noise as a result of the new development'.

12. The significance of noise impacts are described in the National Policy Statement for England (NPSE) which is summarised in the noise chapter. This document introduces the concept of NOEL, LOAEL and SOAEL albeit without attaching numerical values. This concept is described further in the online National Planning Practice Guidance as summarised in the noise chapter. In the noise chapter RAL are at pains to explain their interpretation of gradations above SOAEL ('significant observed adverse effect level') which is summarised in 13.51. RAL state that they consider 'unacceptable' SOAEL to occur only at very high levels which would trigger NIR 1975 and NIR 1996 sound insulation schemes. We do not agree with this

approach and indeed RAL themselves adopt a different stance later in the report when applying BS4142 to the predicted operational noise from the development.

13. The 2012 version of the National Planning Policy Framework (NPPF) is described in the noise chapter. The NPPF was revised in July 2018, presumably after the noise chapter was prepared. Thus, the paragraphs from the 2012 NPPF that are referred to in the noise chapter have been superseded. Relevant sections of the new version of the NPPF are described in the subsequent Addendum report. We agree with para. 13A.8 of the Addendum that the underlying principles relating to environmental noise in the current NPPF have not changed significantly from the previous version and thus this is not an issue with regards to the findings and conclusions of the noise chapter.

14. Various British Standards and other relevant guidance documents relating to environmental noise are not included in the Legislation and Planning section, but are described in Appendix 13.2 and referred to elsewhere in the noise chapter e.g. in the Assessment Methodology section. We confirm that all noise guidance documents relevant to the proposed development have been taken into account in the noise chapter.

Baseline Noise Survey

Original Baseline Noise & Vibration Monitoring as Described in Noise Chapter

15. A baseline noise survey was carried out by RAL at a number of locations within the study area and it is stated that these were agreed beforehand with South Staffordshire Council (SSC). The survey was carried out during 17-23 August 2016 and 12-24 January 2017.

16. The environmental noise monitoring instrumentation used for the survey was appropriate and calibration details are provided in Appendix 13.3. We note that a weather monitoring station was installed at the site during the January survey which is good practice. The August survey period included traffic associated with the V Festival and periods of unsuitable weather, namely high winds which were strong enough to blow two of the noise meters over. During the January survey there were roadworks on the A449, periods of inclement weather and also problems with battery failures at some locations.

17. The baseline survey was extensive and in our experience practical problems are not uncommon during such extended surveys. However, the baseline survey does appear to have focussed on maximising the quantity of data rather than the quality of the data.

18. It is stated that data obtained during periods of inclement weather have been disregarded. Nevertheless, due to the A449 road works, RAL acknowledge that further background noise monitoring is necessary in order to confirm that the 'representative' background noise levels used in the assessment are indeed representative. However, in the interim the current data has been used by RAL in the noise assessment on the basis that traffic noise levels from the A449 are likely to have been lower than normal (i.e. worst-case background noise levels) which is not unreasonable.

19. RAL have not used the lowest background noise levels measured at each location in their assessment and instead, in accordance with the approach recommended in BS4142, have adopted values which are deemed to be 'representative' background levels. This is a standard approach. However, RAL have obtained these values by statistical analysis of the L_{A90} measured at each location and identifying the value above which 75% of the data lies. We have not seen this 'percentile of a percentile' approach used before but the representative values obtained by RAL for the daytime and night-time periods do not appear unreasonable when compared with the range, and mean average, of the measured 15-minute values.

20. Baseline ground vibration monitoring was carried out at two locations near to the West Coast Main Line to establish baseline vibration levels in terms of daytime and night-time vibration dose values. Suitable survey instrumentation has been used.

21. The baseline noise survey section also describes a noise survey that was carried out at by RAL at an operational rail freight facility in Widnes, Cheshire. The purpose of this survey was to obtain typical 'source' noise levels of the rail freight activities for use in subsequent calculations of operational noise from the development proposed at Four Ashes. Obtaining such 'real life' data is a good and robust approach for the calculations. It is stated that sound power levels (SWL) have been calculated from the sound pressure measurements but we cannot reconcile the values. However, in the subsequent assessment of operational noise the SWL values do not appear to have been used in which case this is not an issue.

Updated Baseline Noise Monitoring Described in Addendum

22. Updated baseline noise monitoring was carried out by RAL at 11 locations between 28 June 2018 and 10 July 2018 as described in the Addendum document. The revised map of the baseline noise survey locations is Figure 13A.1.

23. It is considered that the extent of the updated baseline noise survey is reasonable and adequate both in terms of number of survey locations and the survey duration.

24. Suitable environmental noise monitoring instrumentation used for the survey and calibration details are provided in revised Appendix 13A.3. We note that a weather monitoring station was installed at the site during the updated survey. During the survey the weather appears to have been generally suitable for noise monitoring but it is stated that any periods of unsuitable weather (e.g. rain or strong winds) have not been used for assessment purposes which is good practice.

25. It is stated that the noise meters at two survey locations were knocked over/moved but that only data obtained when the meters were upright has been used for assessment purposes.

26. The results of the updated noise survey are summarised in tables within the Addendum report. The new data has been used to establish the representative daytime and background L_{A90} background noise levels. Thus, the previous 'interim' baseline noise survey data that was tabled, and used for assessment purposes, in the ES chapter is no longer being used.

27. It is stated that the updated survey results are generally slightly higher than during the previous baseline noise survey. This is attributed to roadworks on the A449, and atypical traffic conditions in the area, that occurred during the original survey.

28. The updated survey also included 3 new (i.e. additional) baseline noise monitoring locations. At one of these new locations to the west of the A449 (Location N10 at Crateford Lane) the prevailing background noise climate was found to be very low. This location is described by RAL as being near a 'static caravan park' but may be more accurately described as residential park homes.

Construction Phase

29. An assessment of the construction phase has been carried out.

30. The correct British Standards have been used in the assessment of construction noise and vibration.

Construction Noise

31. Suitable indicative calculations of construction noise have been undertaken by RAL based upon the data and procedures in BS5228. The calculations are indicative because they are based upon assumed operations and plant because, as is usual at this stage in the planning process, there are no details available on actual construction activities and plant to be deployed.

32. The assumed construction activities and plant noise data taken from BS5228 are described in Appendix 13.4 and are reasonable.

33. The 'ABC' assessment method of BS5228 has been used which is the normal approach. It is stated correctly in the noise chapter (para 13.176) that, based upon the results of the original baseline noise survey, the lowest (i.e. most onerous) construction site noise limit from BS5228 would apply for this proposed development (i.e. 65 dB $L_{Aeq,T}$) at all nearest residential properties within the study area. The only exception, as a result of the updated baseline noise survey data, is Wood View (Survey Location N2) where a construction noise limit of 70 dB $L_{Aeq,T}$ now applies.

34. The list of receptors for the construction noise assessment has been revised (in Addendum report Table 13A.15) to include 5 additional locations to the west and north of the site. This makes a total of 45 sample assessment locations which we consider is an adequate number for the study area.

35. Similarly, the table of predicted construction noise levels has been updated (in Addendum Table 13A.16), mainly in respect of the additional assessment locations. The results of the indicative construction noise calculations at residential and other noise-sensitive locations are presented as a range of values for different types of construction activities. At the majority of the assessment locations construction noise levels are expected to exceed 65 dB $L_{Aeq,T}$ (or 70 dB $L_{Aeq,T}$ in respect of Wood View) during at least two of the six stages of the construction works.

36. The assessment of magnitude of noise impact has been determined by RAL using the procedure adopted in 13.71 of the ES, the impact being either 'negligible', 'low adverse', 'moderate adverse' or 'high adverse' depending on comparison of the predicted construction noise levels with the 65 dB(A) (or 75 dB(A)) criterion. Another descriptor equating to 'High' impact that is described in the IEMA 'Guidelines for Environmental Noise Impact Assessment is 'Substantial' or 'Severe'.

37. Locations where construction noise impact will be 'high adverse' are identified in Table 13.24 (now replaced by Addendum Table 13A.16). In 13.180 it is stated that for such properties the construction noise is likely to have 'major adverse effects'. At some locations (listed in 13.178) the 65 dB(A) criterion is predicted to be exceeded by a considerable margin.

38. It is stated that a construction environmental management plan (CEMP) will be implemented which will include measures to mitigate noise. However, in 13.193 it is stated that for residential locations where 'high adverse' impact is predicted a bespoke sound insulation scheme (i.e. sound insulation of windows of dwellings) will be implemented. The proposed eligibility criteria for sound insulation are stated in the noise chapter.

39. Whilst this might appear an extreme measure of last resort, it is a pragmatic approach that is described in Appendix E4 of British Standard 5228-1. Thus, such a sound insulation scheme would be in accordance with that British Standard in situations where other noise mitigation measures would not ameliorate construction noise impact adequately.

40. From the initial assessment the sample properties likely to be eligible for sound insulation due to the construction works are listed in 13.196 and in 13.198 it is stated that a further 30 dwellings may be eligible.

41. Residual construction noise effects are summarised in Table 13.39.

42. Cumulative construction noise impact has been considered adequately and no significant cumulative effects are anticipated.

Vibration from Construction Works

43. Vibration from construction works has been considered in the ES noise chapter. Significance criteria are adopted in 13.74. In the assessment 'moderate adverse impact' is defined by RAL as PPV vibration levels between 1mm/s and 10mm/s. However, as stated in Table B1 of BS5228-2, complaints from residents can be expected at a vibration level of 1mm/s and vibration at 10mm/s is so high that it is likely to be intolerable for any more than a very brief exposure. Therefore, we consider that the choice of significance criteria adopted by RAL underestimates the potential significance of effects of vibration between 1mm/s and 10mm/s.

44. However, in the assessment the highest levels of vibration predicted are up to 1mm/s to 3mm/s for some residential locations close to heavy ground works. The conclusion that this would result in a temporary moderate adverse impact is reasonable.

45. It is stated in 13.211 that mitigation of vibration impact is considered later in the chapter but we did not see any reference to specific measures to mitigate construction vibration in the mitigation section. However, this aspect could be addressed in the CEMP.

46. Residual construction noise effects are summarised in Table 13.39.

Construction Traffic

47. Noise impact of construction traffic has also been considered by RAL and it is agreed that, based on the traffic flows stated in Appendix 13.4, noise (and vibration impact) from construction traffic on the highway network is likely to be low/minor.

Operational Phase

48. A comprehensive assessment of operational noise has been carried out based on calculations of likely noise levels at a sample of noise-sensitive locations.

49. The calculations are based on many assumptions which are stated clearly in the text and those assumptions appear to be reasonable.

50. As stated in 13.240, the noise calculations take into account the noise reduction effect of the landscaped earth bunding that is proposed at various locations around the development, on the basis that this is 'embedded' noise mitigation that has been designed to optimise the balance between acoustic and landscaping requirements.

51. Separate information forwarded to us (e.g. parameter plans, section drawings) shows that substantial and extensive earth bunding is proposed and which has been taken into account in the RAL noise calculations. For example, this includes bunding along the western part of the development of between 4.5m to 6m

height (above development ground height), bunding of 8m height to north of dwellings in Station Drive, bunding of 3 - 6m in the south-east area, and bunding of 8m to part of the northern area.

52. The noise impact of on-site operations has been assessed using BS4142:2014, which is the correct standard.

53. Significance criteria based on BS4142 are adopted in Table 13.4. However, we would question the values that have been used in that table. In BS4142, it is stated that a noise Rating Level that exceeds the background noise level by 'around 5dB' indicates 'adverse impact' and a Rating Level of 'around 10dB' indicates 'significant adverse impact'. RAL acknowledge the importance of the word 'around' in 13.77/78 in that the 5dB and 10dB values are not definitive figures, but then do not apply this fact in their subsequent analysis. Thus, in Table 13.4 RAL have taken a Rating Level of between 5dB and 10 dB above the background noise level to be 'moderate adverse impact'. We consider this range to be too high and that a Rating Level of 8 or 9dB above the background noise level should be considered 'high adverse impact' and not moderate.

54. The calculated Specific Sound levels from the operation of the proposed development shown in Table 13.27 within the ES chapter are fairly low. However, as one would expect, the calculated BS4142 Rating Levels which include acoustic feature corrections to take into account the character of the noise at the receptor location, are higher. The table of acoustic feature corrections that have been applied has been revised and the values are now shown in Table 13A.17 of the Addendum. These values appear to be reasonable and the overall corrections range between 3dB and 13 dB at the 45 sample assessment locations.

55. The updated BS4142 assessment is set out in Table 13A.19 of the Addendum and replaces that included in the noise chapter. In many cases the predicted noise Rating Levels exceed the background noise level by a considerable margin. In 13A.91 of the Addendum it is stated that the Rating Levels exceed the background levels at some locations by up to 20 dB.

56. In the BS4142 assessment table (Table 13A.19), the daytime Rating Levels exceed the background noise by 9dB or more at 14 of the 45 sample assessment locations. In the night-time, the Rating Levels exceed the background noise by 9dB or more at 29 of the 45 sample assessment locations. Therefore, in terms of the initial numerical assessment of BS4142, the operational noise from the proposed development amounts to 'significant adverse impact', as defined in BS4142, at these sample assessment locations.

57. Including the sample locations where the operational noise falls within at least 'adverse impact' as defined in BS4142, the numbers are 29 of the 45 sample assessment locations in the daytime and 30 at night.

58. However, BS4142 states that this numerical evaluation is only an initial assessment and that the context needs to be taken into account. The context includes, among other things, whether or not the houses at the assessment location will benefit from additional acoustic screening and/or will have sound insulation measures incorporated.

59. In this case a 'bespoke' sound insulation scheme is proposed for residential properties where 'high adverse' noise impact is predicted (as defined by RAL) i.e. where the BS4142 Rating Level is predicted to be 10dB or more above the background noise level. The likely properties eligible for the sound insulation scheme are described in 13.287/8.

60. It is stated in 13.277 that the eligibility for this sound insulation scheme is set out in a S106 agreement. We do not know if this is a *fait accompli* or not.

61. This approach of ameliorating noise impact of a proposed commercial development by sound insulating the existing dwellings that will be affected is anathema to environmental health practitioners and environmental noise consultants who are used to dealing with standard planning applications. In those cases planning applications which will result in high noise impact that can only be mitigated by sound insulating existing dwellings in the area are normally refused. However, for the DCO cases it is for the Planning Inspectorate to weigh up the regional and national importance of the project against the predicted noise impact taking account of the proposed noise mitigation including where sound insulation of nearby dwellings is considered necessary.

62. Nevertheless, if a 'bespoke' sound insulation scheme is proposed there is no reason why it should be limited to those dwellings where the BS4142 Rating Level is predicted to be over 10dB above the background noise level. As we have stated previously (para. 53), in BS4142 it is stated that a noise Rating Level that exceeds the background noise level by 'around 5dB' indicates 'adverse impact' and a Rating Level of 'around 10dB' indicates 'significant adverse impact'. Due regard needs to be taken of the word 'around'. Therefore, if it is the intention to provide sound insulation of dwellings exposed to 'significant adverse impact' then we would recommend that consideration be given to sound insulating dwellings where the Rating Level would be 8 or 9dB above the background noise level i.e. 'around 10dB' and not just those exposed to 10dB or more above the background noise.

63. Moreover, there is an argument that setting the eligibility criterion so high would ignore those residents who would be exposed to a Rating Level of operational noise that would amount to 'adverse impact' i.e. those exposed to a Rating Level of 'around 5dB' above the background level. Including such residential properties within the insulation scheme would perhaps be a more equitable basis for ameliorating noise impact for those residents living in the area of the proposed development who have been identified by RAL as being subject to adverse impact.

64. However, irrespective of the above, the sound insulation of dwellings will not reduce noise impact in external areas of the residential properties. Whilst it is accepted that sound insulation of dwellings can be designed and implemented to achieve satisfactory noise levels inside the dwellings, some residents will experience a deleterious effect on the quality of the noise environment outside their properties.

65. BS4142 applies outside dwellings not inside. Thus, taking the example of the dwellings/noise climate in Crateford Lane, in any exposed outdoor living areas the conclusion of the initial daytime BS4142 assessment would remain that the Rating Level of operational noise would be 16-18 dB above the background noise level. According to BS4142 this amounts to 'significant adverse impact'. The proposed noise screening mounds have already been taken into account in the noise assessment and no additional amelioration measures for outdoor noise are proposed.

66. Staying with the example of Crateford Lane, the calculated absolute (or 'specific') level of operational noise in the daytime appears to be 41 dB L_{Aeq}. This is a modest level of noise is absolute terms, but short-term peaks of 61 dB L_{Amax} are predicted. The character of this type of noise is such that the operational noise will stand out from the low level of background noise, which was found to be only 34 dB L_{A90} in the daytime. Thus, in this example, as evidenced by the BS4142 assessment, the proposed development would result in a significant adverse effect on the outdoor living conditions of the residents.

67. In the noise chapter and addendum, noise outdoors is considered by reference to BS8233. BS8233 contains acoustic design criteria for proposed new dwellings where it is stated that for outdoor amenity spaces of dwellings it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$. RAL state, correctly, that the predicted operational noise levels at all assessment locations, even including the BS4142 acoustic feature corrections, are within the upper design criterion of 55 dB(A). There it is left and deemed to be acceptable.

68. Whilst we can see the attraction of using the acoustic design criteria for outdoor amenity areas of dwellings from BS8233, we consider that this approach underestimates the potential noise impact of the proposed development on outdoor areas of existing dwellings where the existing noise climate is low, as we have described in paras. 62-64 above. The Environmental Statement needs to fully evaluate noise impact in terms of 'noise change' for people living in the study area of the proposed development. The IEMA 'Guidelines for Environmental Noise Impact Assessment' state in 7.1 that the aim of the noise assessment "is to determine the effect of the expected change in the acoustic environment arising from the proposed development'. In this respect the impact of outdoor noise is most accurately assessed by the BS4142 method, as has already been described, rather than by reference to acoustic design values in BS8233.

69. In the assessment, no sound insulation measures are proposed, or considered to be practicable, for canal boat moorings. The BS4142 Rating Levels of operational noise at the moorings are predicted to be 9-12 dB above the daytime background noise level, and 12-14 dB above the night-time background noise level, mainly due to the character of the operational noise. These values represent 'significant adverse impact'.

70. Cumulative operational noise impact has been considered in the noise chapter and no significant cumulative effects are anticipated.

71. Operational vibration impact has been considered in the noise chapter and it is concluded that this is likely to be negligible.

72. Offsite traffic noise levels are tabled in Appendix 13.5 and are assessed in the text of the noise chapter. In terms of noise change it is concluded that noise impact will be low to moderate. Only one property is deemed to be eligible for sound insulation due to road traffic noise under the Noise Insulation Regulations.

73. Offsite railway noise impact has been evaluated by calculations. The calculate noise changes due to trains serving the proposed development are shown in Table 13.35 and are very low. It is concluded reasonably that there will be no adverse impact.

74. Similarly, offsite vibration from trains has been considered and assessed to the relevant British Standard, BS6472. The assessment concludes that there would be low adverse impact.

Conclusions

75. A thorough noise and vibration assessment has been undertaken and reported in the Environmental Statement and subsequent Addendum.

76. The approach adopted is in accordance with the EIA requirements and the relevant potential sources of environmental noise impacts have been identified and assessed.

77. Relevant British Standards and noise guidelines have been described and applied.

78. An updated baseline noise survey has been undertaken the results of which supersede those in the noise chapter.

79. We have questioned the way that BS4142 has been applied to the significance of noise effects criteria in the assessment.

80. High noise impact has been predicted at some assessment locations both during the construction phase and operational phase.

81. For residential properties subject to the highest impact, the operational noise is to be mitigated by a bespoke sound insulation scheme under the DCO process, using the results of the BS4142 assessment. We consider that the bespoke sound insulation scheme should not be limited to just those properties where the BS4142 Rating Level exceeds the background noise level by 10 dB or more.

82. The proposed bespoke sound insulation scheme for dwellings will not ameliorate outdoor noise levels. Thus, even with the proposed noise bunding, assessed to BS4142 the outdoor levels of operational noise will result in 'significant noise impact' at some residential locations.

For Hepworth Acoustics Ltd.
Yours sincerely,

Paul Bassett BSc MSc FIOA
Technical Director